

REMARKS

Upon entry of the Amendment, Claims 1-5 and 7-12 will be pending in the application.

Claims 6 and 13 are canceled.

Claim 1 is amended to recite “A ~~rubber composition~~ high performance pneumatic tire comprising a tread formed by using a rubber composition comprising (1) a rubber component ~~including~~ comprising at least one rubber selected from the group consisting of polybutadiene rubber and a styrene-butadiene copolymer rubber having a content of vinyl bond of not less than 30% and a bound styrene content of more than 30 mass% but not more than 60 mass%; (2) at least one compound selected from the group consisting of a compound represented by the following formula (I), a compound represented by the following formula (II), a compound represented by the following formula (III) and a compound represented by the following formula (IV); and (3) an organic thiosulfate compound represented by the following formula (V)...”

Support is found, for example, in original Claim 13 and from the values in Table 2 at page 18 of the specification as originally filed. No new matter is added.

Entry of the Amendment is respectfully requested along with reconsideration and review of the claims on the merits.

Formal Matters

Applicants appreciate the Examiner's acknowledgement of receipt of Applicants' claim for foreign priority and receipt of the certified copies of the priority documents.

Applicants also appreciate the Examiner's consideration of the Information Disclosure Statement filed on June 30, 2004.

Allowable Subject Matter

Applicants appreciate the Examiner's indication that Claims 4, 5, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form and if the rejection under 35 U.S.C. 112, second paragraph, is overcome by appropriate amendment.

Applicants submit that each of pending Claims 1-5 and 7-12 is now patentable based on the Amendments to the claims and the following remarks.

Claim Objection

Claim 1 is objected to because of the following informalities: In the description of dithiosulfate (V), the claim indicates that M^3 is one equivalent of a metal ion. The Examiner asserts that since the single terminus of thiosulfate ion is monovalent, it would appear that the stoichiometry is incorrect for the claimed divalent ions (magnesium, calcium, barium, zinc, nickel, and cobalt).

Applicants respond as follows.

Claim 1 is amended to recite " M^3 is one equivalent weight of lithium, potassium, sodium, magnesium, calcium, barium, zinc, nickel or cobalt, provided that the compound may contain crystal water."

Applicants submit that any informalities in Claim 1 are now obviated.

Accordingly, Applicants request reconsideration and withdrawal of the objection to Claim 1.

Claim Rejections - 35 U.S.C. § 112

A. Claims 1-13 are rejected under 35 U.S.C. §112, second paragraph, as assertedly being indefinite. The Examiner states that Component (1) of the claim is drawn to a rubber component including at least one of a polybutadiene rubber and a styrene-butadiene rubber. As written, the Examiner believes that the composition must contain both rubber resins. Component (2) of claim 1 is drawn to a rubber composition comprising at least one compound represented by formula (I), a compound of formula (II), a compound of formula (III), and a compound of formula (IV). As written, the Examiner believes that the composition must contain all four components. The Examiner states that an improper Markush group construction has been used, and this renders the claim vague and indefinite.

In response, Applicants amend Claim 1 to more clearly present the two separate Markush groupings within (1) and within (2). Applicants submit that Claim 1 more clearly presents the elements of the Markush groupings as shown in the Amendments to the Claims.

Accordingly, Applicants request reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, second paragraph.

B. Claim 9 is rejected under 35 U.S.C. §112, second paragraph, as assertedly being indefinite. The Examiner is confused as to whether the total amount of 0.5-10 parts by mass refers to all three components (I), (II), and (III), or each individual component, or a combination thereof.

Applicants respond as follows.

Claim 9 is amended to recite “wherein an amount in total ~~amount~~ of the compound of the formula (I), the compound of the formula (II) and the compound of the formula (III) is 0.5-10 parts by mass based on 100 parts by mass of the rubber component.”

Thus, the amount in total in Claim 9 refers to at least one compound selected from the group consisting of a compound represented by formulae (I), (II), and (III). Applicants submit that Claim 9 clearly satisfies the requirements of 35 U.S.C. § 112, second paragraph.

Accordingly, Applicants request reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, second paragraph.

C. Claim 13 is rejected under 35 U.S.C. §112, second paragraph, as assertedly being indefinite. The Examiner states that Claim 13 provides for the use of a rubber composition, but, asserts that since the claim does not set forth any steps involved in the method/process, it is unclear what method/process Applicants are intending to encompass.

Claim 13 is also rejected under 35 U.S.C. §101 assertedly because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. §101.

Applicants respond as follows.

As previously noted, Claim 13 is canceled. Thus, the rejection of this claim is now rendered moot.

Claim Rejections - 35 U.S.C. § 102 and § 103

A. Claims 1-3, 8, 9, 10, 12, and 13 are rejected under 35 U.S.C. §102(a) as assertedly being anticipated by JP 2002-069236 (Araki), for the reasons given in the Office Action.

The Examiner cites Araki as disclosing a rubber composition comprising 100 pw of a rubber component, 0.1-1.0 pw of a thiuram compound or a dithiocabamate compound, and 0.5-2.0 pw of sodium 1,6-hexamethylene dithiosulfate dihydrate which is useful for the manufacture of a retreaded (pneumatic) tire (citing Araki's Abstract).

B. Claims 1-3, 6-10, 12, and 13 are rejected under 35 U.S.C. §103(a) as assertedly being unpatentable over JP 2002-069236 (Araki) in view of JP 10-195237 (Fujiki), for the reasons given in the Office Action.

The Examiner recognizes that although Araki contemplates use of styrene-butadiene rubber (SBR), there is no indication of the nature of the styrene-butadiene rubber component. The Examiner cites Fujiki as teaching the use of sodium 1,6-hexamethylene dithiosulfate dihydrate as the vulcanization agent for styrene-butadiene rubber, where the heat resistant aging characteristic of the rubber is maximized when the styrene-butadiene rubber has a vinyl content of 35-85% and when the styrene content is 30% or less (citing [0009]).

The Examiner states that regarding Claims 1, 6, and 7, one of ordinary skill in the art would have found it obvious to use the styrene-butadiene rubber disclosed in Fujiki in the composition of Araki in order to achieve optimum heat resistant aging rubber properties, because both patents relate to vulcanization of rubber using sodium 1,6-hexamethylene dithiosulfate dihydrate as the vulcanization agent.

Applicants respond as follows.

Claim 1 is amended as shown above and in the Amendment to the Claims. The present invention is now directed to a high performance pneumatic tire for improving the resistance to thermal fatigue while maintaining a high-gripping property.

In comparison, Araki (JP 2002-069236) discloses a pneumatic tire using a rubber composition suitable as a cushion rubber or the like for joining a retreading rubber to a base tire required in the production of a retreading tire of TBR (truck and bus). Furthermore, Araki fails to disclose Applicants' "bound styrene content of more than 30 mass% but not more than 60 mass%". Araki does not disclose the content of vinyl bond and the bound styrene content of SBR at all. Thus, Araki fails to anticipate the present invention.

Regarding the obviousness rejection, unlike the present invention, Fujiki (JP 10-195237) is concerned with an adherent rubber composition suitable for adhesion to brass plated steel cords. Accordingly, the present invention is also entirely different from the combination of Araki and Fujiki in the technical idea and effects.

Furthermore, Fujiki discloses on paragraph [0009] that the bound styrene content is not more than 30% by weight for maintaining the adhesion property to the steel cord, whereas in the present invention, the bound styrene content is required to be more than 30% by mass but not more than 60 mass% for improving the gripping property as described in paragraph [0020].

Also, as described in the present application at paragraph [0019], the organic thiosulfate compound of the formula (V) is high in the reactivity to natural rubber or 1,4-butadiene or the like but is low in its reactivity with polybutadiene rubber (BR) or SBR having a high vinyl bond

content. For this end, the compound of the formulas (I)-(IV) is added as a vulcanization accelerator, whereby the resistance to thermal fatigue is considerably improved.

These unexpectedly superior effects of the present invention would not have been conceived by one of ordinary skill in the art from the combination of Araki and Fujiki.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(a) and § 103(a).

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

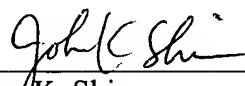
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